RCRA INSPECTION FIELD REPORT: IBM
I. INITIAL INFORMATION:

A. Facility Identification:

EPA Identification No.: VTD0002084705
Facility Name: IBM
Address: 1000 River Road
Essex Junction, VT 05452

Inspector Name(s)/Title(s): Andrew Meyer, Environmental Scientist
Linda Brolin, Environmental Scientist
RCRA, EPCRA and Federal Program Unit, EPA Region I

Is Regulatory Status correctly reflected in RCRAInfo. If (No) explain: Yes

B. Initial Drive-By; Obvious Concerns, Observations, or Questions:

( ) No
(X) Yes-Describe: Inspector Meyer drove around all publically accessible roads surrounding the facility. From this initial observation, the facility and grounds appeared well maintained. Inspector Meyer did not observe any solid/hazardous wastes or chemical inventory stored outside of the Facility.

C. Facility Representatives:

Erik Berliner, Manager Environmental and Energy Conservation Programs
Candace Callahan, Hazardous and Solid Waste Program Manager
Tom Jagielski, Manager of Environmental Programs

D. Introduction:

Date of Inspection: August 17-18, 2009

Type of Inspection: Compliance Evaluation Inspection (CEI)

Type of Facility: ( ) Federal ( ) State ( ) County ( ) City (X) Private

Facility Regulatory: (X) LQG ( )SQG ( ) CESQG (X) TSDF ( ) Transporter

Credentials Presented (Yes/No): Yes

Purpose: To assess the facility's compliance status with state/federal hazardous waste regulations and policies. This is a permitted facility that is authorized to store facility is has a permit to store hazardous waste for greater than 90 days. The last CEI conducted at this facility occurred on July 7, 2002, by the Vermont Department of Environmental Conservation.

E. Access Granted:

(X) Yes
( ) No/describe circumstances:

II. FACILITY DESCRIPTION

Inspectors Andrew Meyer and Linda Brolin (the inspection team) arrived at the facility and were escorted to a conference room by Candace Callahan where we were joined by Eric Berliner. Inspector Meyer explained the purpose and scope of the inspection and explained that the inspection team would be conducting a Compliance Evaluation Inspection (CEI) and would need to tour the facility and review the company's paperwork related to hazardous waste management. Candace Callahan and Eric Berliner agreed to cooperate with the inspectors.

During the in-briefing with Eric Berliner and Candace Callahan, explained the following:

IBM was established in Essex Junction, Vermont in 1957 and currently employs approximately 4,400 workers operating three shifts/day, seven days/week. The facility is arranged in a large, spread-out, campus-type layout and is comprised of 710-acres of land, 8 miles of roadway, 6 acres of parking and 45 acres of roof. The facility includes a wastewater treatment plant, fire station, education center, and cafeteria;

As a semiconductor manufacturer, the IBM facility uses a number of complex manufacturing processes. In general, the manufacture of semiconductors starts with a silicon wafer. The surface of the silicon wafer is cleaned and passivated (i.e., coated to prevent contamination) with a very thin silicon oxide layer. An organic photoresist is applied to the wafer and a circuit pattern is exposed onto the resist by shining light onto the wafer through a mask. The exposed photoresist is washed away, while the remainder is hardened to protect the insulating layer. After this is completed, the wafer is treated with inorganic liquids and gases to create the doped circuits which provide the semiconductor function. The hardened resist is then removed with organic solvents. At certain points in the process, metallization techniques are used to electrically connect the stacked layers of the semiconductor device. Wafer cleaning and rinsing steps, using mixtures of inorganic acids, oxidizers, and deionized water, occur after many of the process steps. This process cycle is repeated until a fully functional memory or logic device has been produced. After the circuits are built on the wafer, minute amounts of metal are deposited onto the wafer to produce the connections which marry the semiconductor to a module or circuit board for use in a computer. Finally, the wafer is sliced into individual chips for testing and placement onto substrates or modules for use in computer systems. Nearly all of these steps take place within large automated devices referred to as "tools". Chemicals and water used in these manufacturing steps are piped directly into the tools and wastes piped directly out of the tools to hazardous waste storage tanks or to the biological and industrial wastewater treatment facilities serving the plant;

In addition to being a large quantity generator of hazardous wastes, IBM is permitted for storage of hazardous waste in tanks and containers. DEC issued a Hazardous Waste Facility Certification March 3, 1994. This permit was renewed in May, 2007. The permit specifies corrective action activities and authorizes hazardous waste container storage in the Chemical Distribution Center (CDC) Building 974, in hazardous waste tank storage in the CDC Tank Farm and in the "Building 963 North" Tank. The permit also authorizes the transfer of certain hazardous wastes to the Biological Wastewater Treatment Plant and to the Industrial Wastewater Treatment Plant. IBM is also permitted to receive hazardous waste generated off-site from other nearby IBM facilities;

The facility is staffed with an emergency response team that is on-site 24 hours/day, seven days a week. Additionally, the facility has mutual aid agreements with local police and fire agencies. On

June 5, 2009, IBM has reported a 10-gallon spill of liquid mixed with sludge from an emergency holding tank. No other spills in the last three years have required any evacuations or significant response actions;

IBM has ongoing groundwater remediation at the facility for perchorethylene, trichloroethane, xylenes, and acetone. The remediation is via groundwater pump and treatment, and soil vapor recovery. The remediation was started by IBM voluntarily in the early 198os. Contamination levels have been steadily decreasing. The ongoing remediation is anticipated to last approximately 50-years;

IBM receives its water from the Champlain Water District. Additionally, the facility operates under a general air permit for the entire operation issued through the State of Vermont; and

IBM is equipped with seven 10,000-gallon hazardous waste and one 9,000-gallon emergency tank, located at the Northeast Corner of the Main Manufacturing Building.

III. Physical Walk-Thru

Day #1

BUILDING 963 NORTH TANK

After the in-briefing, the inspection team was escorted by Candace Callahan to the permitted part of IBM's operation, which Candace Callahn identified as the Chemical Distribution Center. On the way to the Chemical Distribution Center, Inspector Meyer passed an above-ground tank identified by Candace Callahan as an emergency tank that is used as an emergency back-up. Candace Callahan explained that this tank was empty at the time of the inspection and ordinarily remains empty and is in place to be used exclusively as an emergency backup tank to accept General Solvent waste.

BUILDING 900 EMERGENCY SERVICES (photographs taken)

The inspection team observed four tanks, identified by Candace Callahan as 450,000-gallon #6 oil tanks. The inspection team also observed one 20,000-gallon tank identified by Candace Callahan as a kerosene tank. Candace Callahan explained that these tanks are used as back-up emergency sources for IBM's boiler fuel, which primarily burns natural gas.

Chemical Distrubution Center (permitted storage area):

CDC TANK FARM (photographs taken)

Candace Callahan explained that tankers load tanks in the area with virgin products, and also unload the nine waste tanks, all of which are continuously electronically monitored. The tank system is equipped with a vapor collection system that is comprised of five carbon adsorption drums. Each hazardous waste tank is vented directly via a closed-vent system capable of capturing and transporting vapor leakage from the conservation vents to the activated carbon emission control device system. Candace Callahan explained that when they become spent, the canisters are shipped off-site as hazardous waste, and typically are fuel-blended for incineration.

Each of the observed permitted hazardous waste tanks is spray painted with the words "hazardous waste" and an abbreviation of the name of the waste in the tank. For example, tanks storing n-butyl ethyl acetate were marked as "NBA". Tanks storing gamma butyl acetone were marked as "GBA". Inspector Meyer suggested marking the tanks with the actual words of the contents, instead of just an abbreviation, in order to ensure that emergency responders are fully aware of their contents. Inspector Meyer also requested copies of the last tank assessments for each of IBM's hazardous waste tanks, which were provided shortly after the inspection.

The inspection team noted that security provisions were adequate. The gate was locked and the fence was in good repair. "No Smoking" and "Danger-Hazardous Waste Storage Area-Authorized Personnel Only" signs were well posted in the area.

Permitted Flammable Waste Drum Storage Area (photographs taken)

Candace Callahan explained that IBM is permitted to store up to ninety-six 55-gallon drums of flammable waste. The permit allows each drum to be stored for up to 1-year. Containers are stored in a designated area and inspected daily. The inspection team did not observe any areas of concern in this area.

Permitted Main Waste Storage Area (photographs taken)

Candace Callahan explained the inventorying process for each container. The facility is permitted to store 1,100 containers total, in the three designated storage areas (corrosives, flammables, warehouse). The inspection team requested and received a copy of the daily inventory log for the day of the inspection. The inspection team randomly selected drums from the inventory, all of which were fully labeled and located in their designated area, as depicted on the daily inventory log.

Permitted Chemical Warehouse (photographs taken)

The inspection team observed one 1-cubic-yard box marked with the words, universal waste, non-regulated waste. Inspector Meyer explained that the two terms were contradictory, and that the words "non regulated" should not be marked on a container of universal waste.

Fab Buildings 970 and 973

Next, the inspection team proceeded to the fabrication operations in Buildings 970 and 973. These are large production areas, almost all of the production in these buildings occurs in clean-rooms, using specially designed tools. All waste generated by these production processes are directly hard-piped into IBM's hazardous waste tank system or to IBM's Industrial Wastewater Treatment Plant (IWTP). No concerns were noted.

Day #2

INDUSTRIAL WASTEWATER TREATMENT PLANT

The second day of the inspection began at the IWTP. The inspection team was escorted by Eric Berliner and Dave Cost, Chief Wastewater Treatment Plant Operator. Dave Cost explained that all wastewaters produced at the IBM, Essex Junction facility are processed through the IWTP. The

approximately 150,000 gallons per day of flow from chemical mechanical polishing waste is combined with 150,000 gallons on sanitary waste and approximately 3 million gallons per day of other industrial wastewater. Dave Cost described the treatment process in detail.

The IWTP is designed primarily to remove metals out of solution through precipitation by pH adjustment and flocculation. The treated wastewater is then directed to clarifiers where the solids are removed and directed to thickener tanks and finally filter presses to produce a lime filter cake. This filter cake was previously classified as a non-hazardous waste as the result of a Project XL agreement between the USEPA and IBM, but this classification has expired. IBM presently manages the filter-cake as F006 hazardous waste because a very small amount of the treated wastewater (approximately 100-150 gallons per day) comes from a non-segregated platinum deposition process, that is subject to the F006 listing. Candace Callahan explained that IBM is actively pursueing a delisting of this wastestream with EPA-Region 1, but in the interim, is managing this wastestream as F006 hazardous waste. At an area identified as the IWTP Less than 90 Day Storage Area, the inspection team observed two plate and frame filter presses where the F006 filter residue was actively being filter pressed into a hopper below the press and into appropriately managed and labeled roll-off containers positioned below the filter presses.

V. DOCUMENT REVIEW:

A. Training Plan: IBM is satisfying its requirements. Its training records system is maintained on-line, with copies available upon request. Specific training units are allocated to a job title, and additional units are decided by supervisors as required by the individuals' duties. All completed training is documented within the system. No areas of concern were noted by the inspection team.

B. Training Records: Training Records are kept in the operating record. Candace Callahan was able to readily gather all training records requested by the inspection team. No areas of concern were noted by the inspection team.

C. Contingency Plan: A current copy of the plan, last updated on February 6, 2009 was reviewed after the inspection. No concerns were noted by the inspection team.

D. Manifests/LDRs: Manifests/LDRs for 2007, 2008 & 2009 were reviewed during the end of Day #1. No concerns were noted by the inspection team.

E. Inspection Logs: Daily inspection logs were reviewed during the inspection. Additionally, while at the permitted container storage areas, Inspector Meyer reviewed some older inspection logs for 2008 and 2009. Inspector Meyer suggested that training be emphasized that these logs must be legible, because a few of the reviewed logs were difficult to read.

VI. CLOSING CONFERENCE:

During the afternoon of August 18, 2009, the inspection team held a closing conference with Candace Callahan, Eric Berliner, and Tom Jagielski, Manager of Environmental Programs. The inspection team explained that they would still be reviewing the documents provided during the inspection, but that overall, only a few issues of concern were noted, including:

-failure to adequately label hazardous waste containers with words that describe the contents in the tank. IBM's existing practice of labeling tanks with acronyms does not adequately describe the tank's contents;

-make sure that universal waste containers are not also marked as "non-regulated"; and

-make sure that inspection logs are completely legible.

Before leaving Inspector Meyer explained that the information gathered during the inspection would be evaluated to determine IBM's compliance status at the time of the inspection. The inspection team explained that if necessary, IBM may be contacted through an Information Request or through less formal channels such as a telephone call or e-mail. Furthermore, the inspection team explained that after all the relevant information is collected and reviewed, EPA would determine what, if any, appropriate follow-up response might be. The inspection team concluded the inspection by briefly explaining the types of responses that EPA has the authority to issue. The inspection team explained that they could be contacted at anytime to discuss IBM's corrective measures. After answering a few more questions about EPA's process following the inspection, the inspection team left the facility.

VII. LIST OF ATTACHMENTS

ATTACHMENT 1: IBM Confidential training documents for Reginald Beliveau, George Severance, Eric Berliner, Candice Callahan, Michael Mashia;
ATTACHMENT 2: Schematic of Buildings and Grounds of IBM, Essex Junction, VT;
ATTACHMENT 3: EPA Region 1 Digital Images taken during August 17-18, 2009 RCRA Inspection at IBM, Essex Junction, VT;
ATTACHMENT 4: Tank Certification Documents;
ATTACHMENT 5: Copies of agenda's of training courses provided to IBM employees;
ATTACHMENT 6: List of accumulation area locations and owners;
ATTACHMENT 7: Copies of training certification documents;
ATTACHMENT 8: Copy of 2007 Hazardous Waste Report for IBM, Essex Junction, VT;
ATTACHMENT 9: Copy of Personnel Training Plan;
ATTACHMENT 10: Copy of Waste Container Inventory for 8/17/09; and
ATTACHMENT 11: Copy of WTP Sludge 90-day Storage Area Daily Inspection Log